Travel medicine
An Emerging Field of Infectious Diseases

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European Centre for Disease Prevention and Control
Collaborative Network for Travel and Tropical Medicine

Vienna, April 12th, 2010
What is Travel medicine?

An interdisciplinary speciality concerned with Prevention / Management / Research of health problems associated with travel.

1988: First CISTM in Zurich
2009: > 2000 participants from 65 countries at the 11th CISTM in Budapest

Initially derived from Infectious Diseases & Tropical Medicine

Now encompasses: Primary care / migrant medicine / Occupational Medicine / Wilderness Medicine / International Health
16th century: Smallpox and Measles devastating Native American populations
The Grand-Saint-Antoine & The 1720 Great Plague of Marseille

Killed more than 100,000 people in the city and the surrounding provinces. 25%-50% overall death rate
EDITORIAL

Travel medicine, a speciality on the move

Clinical Microbiology and Infection, Volume 16 Number 3, March 2010

P. Gautret¹,² and D. O. Freedman³
Approximately + 6% per year

Approximately 80 million persons from industrialized nations travel to the developing world each year.

More than 200 million persons now reside outside their country of birth.

With 1 billion people crossing international borders each year, there is no where in the world from which we are remote and no one from whom we are disconnected.
100,000 travelers to developing world for 1 month

- 50,000 will develop some sort of health problem during the course of their trip
- 8,000 will see a physician
- 5,000 will be confined to bed
- 1,100 travelers will be incapacitated in their work either abroad or upon returning home
- 300 will have to be hospitalized either during their trip or upon their return
- 50 travelers will have to be air evacuated out of the country they are visiting
- 1 will die
Causes of Mortality in Travelers

- Cardiovascular Disease 49%
- Injury (Unintentional) 22%
- Medical 13.7%
- Cancer 5.9%
- Others/Unknown 5.5%
- Suicide/Homicide 2.9%
- Infectious Disease 1.0%

TRAVELLERS & (RE)EMERGING INFECTIONS

• (Re)Emerging Diseases that pose risk to travellers

• (Re)Emerging Diseases that travellers may bring home and clinicians need to be aware in order to diagnose

• Travellers as Vectors (spread of “traditional” diseases that may be transmitted on return)

• Travellers as Vectors (spread of novel diseases)
(Re)Emerging Diseases that pose risk to travellers

(Re)Emerging Diseases that travellers may bring home: a challenge for clinicians & microbiologists need

Travellers as Vectors (spread of “traditional” diseases that may be transmitted on return)

Travellers as Vectors (spread of novel diseases)
Figure 1: Global examples of emerging and re-emerging infectious diseases, some of which are discussed in the main text. Red represents newly emerging diseases; blue, re-emerging/resurging diseases; black, a ‘deliberately emerging’ disease. Adapted, with permission, from ref. 23.
Emerging diseases 'hotspots'

EID events dominated by zoonoses (60%): 72% originate in wildlife
54% of EID events: bacteria or rickettsia

database of 335 EID 'events' 1940 - 2004

“…..the fact that Mali has not been considered endemic for Lassa fever made the clinical diagnosis difficult. As a consequence, the initial risk of Lassa fever was considered low…. Universal barrier precautions were used throughout, but not the high levels of protection currently recommended for viral haemorrhagic fevers ”
Importation of West Nile Virus Infection from Nicaragua to Spain

Begoña Monge Maillo,*
Rogelio López-Vélez,*
Francesca Norman,*
Fernando de Ory,†
María Paz Sanchez-Seco,†
and Cesare Giovanni Fedele†

New cases of WNV infection arising outside classic areas of high risk.

Emerging Infectious Diseases • www.cdc.gov/eid • Vol. 14, No. 7, July 2008
TRAVELLERS & (RE)EMERGING INFECTIONS

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2006: The second most frequent identified etiology after malaria for systemic febrile illness in ill returned travelers (Freedman et al, N. Engl J Med)
Tick Borne Rickettisoses AFRICA 1990

- R. conorii conorii
- R. conorii israelensis

African Tick Bite Fever (R. africae)
The Typical Tick Borne SFG rickettsioses in Travelers

Rickettsia africae, a Tick-Borne Pathogen in Travelers to Sub-Saharan Africa

Didier Raoult, M.D., Ph.D., Pierre E. Fournier, M.D., Ph.D., Florence Fenollar, M.D., Mogens Jensenius, M.D., Tine Price, M.D., Jean J. de Pina, M.D., Giuseppe Caruso, M.D., Nicola Jones, M.D., Herman Lafert, M.D., D.T.M.H., John E. Rosenblatt, M.D., and Thomas J. Marrie, M.D.

Table 2. Country of Origin and Country in Which the Disease Was Acquired in the Case of 119 Patients with Rickettsia africae Infection.

<table>
<thead>
<tr>
<th>Country of Origin</th>
<th>No. of Patients</th>
<th>Country in Which Infection Occurred</th>
<th>No. of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>62</td>
<td>South Africa</td>
<td>71</td>
</tr>
<tr>
<td>Denmark</td>
<td>14</td>
<td>Swaziland</td>
<td>10</td>
</tr>
<tr>
<td>Norway</td>
<td>13</td>
<td>Lesotho</td>
<td>14</td>
</tr>
<tr>
<td>Italy</td>
<td>5</td>
<td>Zimbabwe</td>
<td>14</td>
</tr>
<tr>
<td>Great Britain</td>
<td>6</td>
<td>Botswana</td>
<td>1</td>
</tr>
<tr>
<td>Austria</td>
<td>12</td>
<td>Gambia</td>
<td>1</td>
</tr>
<tr>
<td>United States</td>
<td>3</td>
<td>Tanzania</td>
<td>1</td>
</tr>
<tr>
<td>Canada</td>
<td>2</td>
<td>Kenya</td>
<td>1</td>
</tr>
<tr>
<td>Switzerland</td>
<td>1</td>
<td>Gabon</td>
<td>1</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>1</td>
<td>Central African Republic</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Côte d’Ivoire</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Great Britain*</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Guadeloupe</td>
<td>2</td>
</tr>
</tbody>
</table>

NEJM 2001; 344: 1504-10
African Tick-bite Fever in French Travelers

Table. Epidemiologic, clinical, and serologic information for 10 patients with African tick-bite fever*

<table>
<thead>
<tr>
<th>Patient</th>
<th>Sex/age (y)</th>
<th>Tick bite</th>
<th>Delay before onset (d)</th>
<th>Fever</th>
<th>Headache</th>
<th>Myalgia</th>
<th>Eschar (site)</th>
<th>Skin rash</th>
<th>1st serum† IgG/IgM</th>
<th>2nd serum† IgG/IgM</th>
<th>Diagnosis</th>
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<tr>
<td>1</td>
<td>M/62</td>
<td>No</td>
<td>7</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Multiple (legs)</td>
<td>No</td>
<td>NA</td>
<td>NA</td>
<td>Probable</td>
</tr>
<tr>
<td>2</td>
<td>F/58</td>
<td>No</td>
<td>6</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Multiple (legs, arms)</td>
<td>No</td>
<td>64:32</td>
<td>64/128</td>
<td>Confirmed</td>
</tr>
<tr>
<td>3</td>
<td>M/58</td>
<td>No</td>
<td>6</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Single (trunk)</td>
<td>No</td>
<td>64/32</td>
<td>128/16</td>
<td>Confirmed</td>
</tr>
<tr>
<td>4</td>
<td>F/51</td>
<td>No</td>
<td>6</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Multiple (legs, trunk)</td>
<td>No</td>
<td>0/64</td>
<td>128/16</td>
<td>Confirmed</td>
</tr>
<tr>
<td>5</td>
<td>M/58</td>
<td>No</td>
<td>5</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Multiple (legs)</td>
<td>No</td>
<td>512/0</td>
<td>512/0</td>
<td>Confirmed</td>
</tr>
<tr>
<td>6</td>
<td>F/57</td>
<td>No</td>
<td>5</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes (unknown)</td>
<td>Yes</td>
<td>NA</td>
<td>32/16</td>
<td>Confirmed</td>
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<tr>
<td>7</td>
<td>M/65</td>
<td>No</td>
<td>5</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Multiple (hands)</td>
<td>No</td>
<td>128/64</td>
<td>512/128</td>
<td>Confirmed</td>
</tr>
<tr>
<td>8</td>
<td>F/59</td>
<td>No</td>
<td>10</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Multiple (legs, arms, trunk)</td>
<td>No</td>
<td>64/8</td>
<td>128/32</td>
<td>Confirmed</td>
</tr>
<tr>
<td>9</td>
<td>M/53</td>
<td>No</td>
<td>3</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Multiple (legs, arms, trunk)</td>
<td>No</td>
<td>64/8</td>
<td>1024/512</td>
<td>Confirmed</td>
</tr>
<tr>
<td>10</td>
<td>M/51</td>
<td>No</td>
<td>8</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Multiple (legs)</td>
<td>No</td>
<td>32/32</td>
<td>64/64</td>
<td>Confirmed</td>
</tr>
<tr>
<td>Total (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>60/40</td>
<td>30/90</td>
<td></td>
</tr>
</tbody>
</table>

*NA, not available; Ig, immunoglobulin; male-to-female ratio, 60%; mean age = 57.2 ± 4.5 years.
†Identical results obtained with both *Rickettsia africae* and *R. conorii* antigens.
First identification of *Rickettsia sibirica mongolitimonae* in a traveler from Egypt

(15ᵗʰ case worldwide)

2010, Submitted
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The spread of poliomyelitis via international travel

Countries reporting wild poliovirus cases in the last 6 months*

*As of 1 September 2009
- Red: Countries reporting indigenous wild polioviruses
- Orange: Countries reporting imported wild polioviruses
The spread of poliomyelitis via international travel

Imported Case of Poliomyelitis, Melbourne, Australia, 2007

Andrew J. Stewardson, Jason A. Roberts, Carolyn L. Beckett, Hayden T. Prime, Poh-Sien Loh, Bruce R. Thorley, and John R. Daffy

Wild poliovirus–associated paralytic poliomyelitis has not been reported in Australia since 1977. We report type 1 wild poliovirus infection in a man who had traveled from Pakistan to Australia in 2007. Poliomyelitis should be considered for patients with acute flaccid paralysis or unexplained

Emerging Infectious Diseases • www.cdc.gov/eid • Vol. 15, No. 1, January 2009
15 cases reported
No indications that the outbreak has spread to the indigenous population in Norway.
Only one other case of measles, imported from Pakistan, has been reported in Norway this year.
Measles transmission in immunized and partially immunized air travellers.

Coleman KP, Markey PG.

Centre for Disease Control, Department of Health and Families, Northern Territory Government, Australia.

Abstract

SUMMARY Most cases of measles in Australia are associated with travel or acquired from travellers from overseas. This study presents a series of three secondary cases of measles acquired through contact with a case of infectious measles acquired in China. Two of the cases were fully immunized siblings sitting eight rows behind the index case on a 4(1/2)-h flight from Singapore. The third case was acquired in the airport where the index case was in transit. The report highlights the travel-associated risk of measles and discusses the heredity of vaccine-induced measles immunity.
Rapid communications

Nosocomial measles cluster in Denmark following an imported case, December 2008-January 2009

C Groth¹, B E Böttiger², A Plesner³, A H Christiansen⁴, S Glismann⁴, B Høgh (Birthe.Hoegh@vhv.regionh.dk)⁴

A cluster of six confirmed cases with identical measles virus genotype was reported in Denmark between December 2008 and January 2009. Transmission occurred among unvaccinated children aged 15-23 months admitted to the same hospital as a 36-month-old unvaccinated girl diagnosed with measles following travel. The findings highlight the importance of vaccination before travelling and adherence to the routine vaccination schedule.

EUROSURVEILLANCE Vol. 14 · Issue 8 · 26 February 2009
• (Re)Emerging Diseases that pose risk to travellers

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SARS: The new challenge to International Health and Travel medicine

Sickness and Silence Lead to an Epidemic

 EVENTS IN MAINLAND CHINA

NOV. 16 First known case of atypical pneumonia occurs in the city of Foshan, Guangdong province.

DECEMBER AND JANUARY
Cases appear in cities around Guangzhou. An unusually high percentage of them, about 5 percent, are food handlers or chefs. The outbreaks are kept secret.
SARS: Global spread from Hotel M

Hong Kong SAR
95 HCW
>100 close contacts

Guangzhou, Guangdong Province, China

Canada
18 HCW
11 close contacts

Ireland
0 HCW

United States
1 HCW

Vietnam
37 HCW
21 close contacts

Singapore
34 HCW
37 close contacts

Hong Kong
SARS: Global spread from Hotel M

SARS: Cumulative Number of Reported Probable Cases
Total number of cases: 5865 as of 1 May 2003, 18:00 GMT+2

Cumulative number of Reported Cases
(From 1 November 02 to 1 May 03)

Type of transmission
- no local transmission
- local transmission

Canada: 147
United States of America: 54
United Kingdom: 6
Ireland: 1
France: 5
Spain: 1
Switzerland: 1
Germany: 7
Poland: 1
Romania: 1
Bulgaria: 1
Sweden: 3
Mongolia: 6
China: 1638
Japan: 2
China, Taiwan: 89
China, Macao SAR: 1
China, Hong Kong SAR: 1600
Philippines: 4
Viet Nam: 63
India: 1
Thailand: 7
Singapore: 201
Malaysia: 6
Indonesia: 2
Australia: 4
South Africa: 1
Brazil: 2

World map showing the global spread of SARS with various countries and cities marked.
New Influenza A (H1N1) Global Spread

New Influenza A (H1N1),
Number of laboratory confirmed cases and deaths as reported to WHO

Total: 11,168 cases
86 deaths
THE CHIKUNGUNYA PARADIGM

- (Re)Emerging Diseases that pose risk to travellers

- (Re)Emerging Diseases that travellers may bring home: a challenge for clinicians & microbiologists need
  
  - Travellers as Vectors (spread of “traditional” diseases that may be transmitted on return)
  
  - Travellers as Vectors (spread of novel diseases)
potential for major epidemics that re-emerge after an unpredictable period of silence

1999–2000: Democratic Republic of the Congo, an estimated 50,000 persons infected after 39 years without any isolation of the virus

2001–2003: Indonesia, after a near 20-year hiatus of epidemic CHIKV activity


September 18th, 2006: an estimate of 266,000 residents infected (population 770,000)

Peak end of January: 45,000 cases / week!

248 death certificates mentioning “CHIKV” as the possible cause of death!!!

> 61 years old +++

**AFTER INDIAN OCEAN ISLANDS: INDIA!**

# Chikungunya epidemic in India: a major public-health disaster

<table>
<thead>
<tr>
<th>Country</th>
<th>Cases</th>
<th>Deaths reported/ (estimated)</th>
<th>Mortality rate per 100 000 cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Réunion (France)</td>
<td>258 000</td>
<td>237</td>
<td>91.8</td>
</tr>
<tr>
<td>India reported by government</td>
<td>1391165</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>India conservative estimate</td>
<td>1391165</td>
<td>(1194)</td>
<td>91.8</td>
</tr>
<tr>
<td>India moderate estimate</td>
<td>6.5 million</td>
<td>(6389)</td>
<td>91.8</td>
</tr>
<tr>
<td>India full estimate</td>
<td>6.5 million</td>
<td>(19168)</td>
<td>275.6†</td>
</tr>
</tbody>
</table>

*Assuming under reporting—actual numbers estimated as five times the reported number. †Assuming mortality in India is three times that in Réunion.

Table: Reported cases, deaths, and estimated deaths in Réunion and India
OTHER REEMERGENCES

Chikungunya Outbreak, Singapore, 2008

To the Editor: Chikungunya

Yee S. Leo, Angela L.P. Chow, Li Kiang Tan, David C. Lye, Li Lin, and Lee C. Ng

Reemergence of Endemic Chikungunya, Malaysia

Sazaly AbuBakar,* I-Ching Sam,* Pooi-Fong Wong,* NorAziyah MatRahim,* Poh-Sim Hooi,* and Nuruliza Roslan*

Emerging Infectious Diseases

➢ 20,000 estimated cases in Thailand by May 15, 2009
Indian Ocean islands: popular tourist destinations.

WTO, 2004:
- 719,000 tourists arrived in Mauritius,
- 430,000 in Reunion Island
- 229,000 in Madagascar
- 121,000 in the Seychelles in 2004.

European tourists +++

During the past months several CHIKV-infected visitors returned home to countries
CHIKV INFECTION IN FRANCE

First cases hospitalized as early as 2005

70,000 inhabitants originating from Comoros Islands

the « capital » or the « 5th Island » of the Comoros

Incidence of Chikungunya-infected returned travellers, Marseilles - France, 03-2005 to 04-2006

- Mauritius
- Seychelles
- Reunion Island
- Comoros Archipelago

Numbers of cases
Novel Chikungunya Virus Variant in Travelers Returning from Indian Ocean Islands

Philippe Parola,*†† Xavier de Lamballerie,** Jacques Jourdan,¶ Clarisse Rivery,*
Véronique Vaillant,# Philippe Minodier,* Philippe Brouqui,*† Antoine Flahault,** Didier Raoult,†‡
and Rémi N. Charrel†§

Emerging Infectious Diseases • www.cdc.gov/eid • Vol. 12, No. 10, October 2006
Chikungunya Infection

An Emerging Rheumatism Among Travelers Returned From Indian Ocean Islands. Report of 47 Cases

Fabrice Simon, MD, Philippe Parola, MD, PhD, Marc Grandadam, PhD, Sabrina Fourcade, MD, Manuela Oliver, MD, Philippe Brouqui, MD, PhD, Pierre Hance, MD, Philippe Kraemer, MD, Ali Mohamed, MD, Xavier de Lamballerie, MD, PhD, Rémi Charrel, MD, PhD, and Hugues Tolou, MD, PhD

Medicine
Volume 86, Number 3, May 2007
ACUTE STAGE: THE RASH

Simon et al. Medicine, 86 (3), May 2007
ACUTE STAGE: THE RASH

common oedema of the face accompanying the rash

Simon et al. Medicine, 86 (3), May 2007
ACUTE STAGE: ARTHRITIS

Simon et al. Medicine, 86 (3), 2007
Chikungunya Virus–Induced Myopericarditis: Toward an Increase of Dilated Cardiomyopathy in Countries with Epidemics?

Fabrice Simon,* Philippe Paule, and Manuela Oliver

**Figure 1.** Horizontal long-axis cardiac magnetic resonance image of the patient 10 minutes after injection with gadolinium, showing subepicardial-delayed enhancement in the apical and apicolateral walls of the left ventricle and the lateral wall of the right ventricle (arrows).

SECOND PHASE OF CHIKV INFECTION

Not constant
Seems affected by age and underlying diseases: rheumatic or traumatic +++

Early exacerbation / Relapses / Long-lasting rheumatism

Temporary increase of handicap - joint pain and stiffness +/- dysesthesia in the extremities

Transitory peripheral vascular disorders such as Raynaud syndrome

Chronic hypertrophic tenosynovitides +++ +/- nerve tunnel syndromes in wrists or ankles

Simon et al. Medicine, 86 (3), May 2007
CHIKV-induced chronic rheumatism

Several clinical components +/- associated
- exacerbation of pain on movement in previously injured joints and bones
- finger and toe polyarthritis with morning pain and stiffness

Handicap in handling objects during daily life can be major, leading to prolonged sick leave
Severe subacute tenosynovitis/bursitis on hands, wrists and ankles
Tenosynovitis and Vascular Disorders Associated with Chikungunya Virus–Related Rheumatism

To the Editor—

Philippe Parola,¹ Fabrice Simon,² and Manuela Oliver²
Persisting Mixed Cryoglobulinemia in Chikungunya Infection

Manuela Oliver¹, Marc Grandadam², Catherine Marimoutou³, Christophe Rogier³, Elisabeth Botelho-Nevers⁴, Hugues Tolou², Jean-Luc Moalic¹, Philippe Kraemer⁴, Marc Morillon⁵, Jean-Jacques Morand⁶, Pierre Jeandel³, Philippe Parola⁷, Fabrice Simon⁵*
The Risk of CHIKV Globalisation
Chikungunya Fever, Hong Kong

To the Editor: Vol. 12, No. 11, November 2006

Chikungunya Virus Infection in Traveler to Australia

To the Editor: Vol. 13, No. 3, March 2007

Two Imported Chikungunya Cases, Taiwan

To the Editor: Vol. 14, No. 8, August 2008
the Asian tiger mosquito: the implicated vector in Indian Ocean. Originally indigenous to South-east Asia, the Western Pacific and Indian Ocean, but has recently spread to Africa, the Middle-East, Europe and the Americas, mainly because of transportation of dormant eggs in tyres.
A single new mutation (E1-A226V) present in the CHIKV isolates in all places providing selective advantage for CHIKV transmission by *Ae. albopictus*
« If viremic patients arrive in Italy, France, or elsewhere in southern Europe during the summer, however, they could cause a European outbreak » Parola et al. Emerg Infect Dis October 2006

Risk map: Knudsen et al., 1996, maj F Schaffner
Figure 1. Weekly density of *Aedes albopictus* in Rome. Percentage of positive traps out of 650 traps (bars, left axis), and mean number of eggs by positive traps (black line, right axis).
# Imported Chikungunya Infection, Italy

**Emerging Infectious Diseases**  
*Vol. 13, No. 8, August 2007*

<table>
<thead>
<tr>
<th>Patient no.</th>
<th>Sex</th>
<th>Age, y</th>
<th>Reason for travel</th>
<th>Country of origin</th>
<th>Date of return (length of stay, d)</th>
<th>Date of first medical assessment after return (delay, d)</th>
<th>Last date of fever (length of fever, d)</th>
<th>Fever on date of return?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1*</td>
<td>M</td>
<td>32</td>
<td>Business</td>
<td>Réunion</td>
<td>Feb 23 (93)</td>
<td>Feb 25 (2)</td>
<td>Feb 26 (4)</td>
<td>Yes</td>
</tr>
<tr>
<td>2†</td>
<td>F</td>
<td>39</td>
<td>Tourism</td>
<td>Mauritius</td>
<td>Feb 28 (10)</td>
<td>Feb 28 (0)</td>
<td>Feb 28 (4)</td>
<td>Yes</td>
</tr>
<tr>
<td>3‡</td>
<td>M</td>
<td>46</td>
<td>Tourism</td>
<td>Mauritius</td>
<td>Mar 7 (10)</td>
<td>Mar 7 (0)</td>
<td>Mar 6 (5)</td>
<td>No</td>
</tr>
<tr>
<td>4‡</td>
<td>M</td>
<td>32</td>
<td>Tourism</td>
<td>Madagascar</td>
<td>Mar 7 (15)</td>
<td>Mar 8 (1)</td>
<td>Mar 4 (4)</td>
<td>No</td>
</tr>
<tr>
<td>5§</td>
<td>M</td>
<td>49</td>
<td>Tourism</td>
<td>Mauritius</td>
<td>Mar 08 (16)</td>
<td>Mar 15 (7)</td>
<td>Mar 4 (5)</td>
<td>No</td>
</tr>
<tr>
<td>6‡</td>
<td>M</td>
<td>66</td>
<td>Tourism</td>
<td>Madagascar</td>
<td>Mar 24 (15)</td>
<td>Mar 24 (0)</td>
<td>Mar 27 (5)</td>
<td>Yes</td>
</tr>
<tr>
<td>7§</td>
<td>M</td>
<td>36</td>
<td>Tourism</td>
<td>Mauritius</td>
<td>Apr 4 (15)</td>
<td>Apr 5 (1)</td>
<td>Apr 1 (6)</td>
<td>No</td>
</tr>
<tr>
<td>8*</td>
<td>F</td>
<td>43</td>
<td>Resident</td>
<td>Madagascar</td>
<td>Apr 10 (–)</td>
<td>Apr 11 (1)</td>
<td>Mar 2 (6)</td>
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<td>9†</td>
<td>F</td>
<td>46</td>
<td>Tourism</td>
<td>Réunion</td>
<td>Jan 30 (16)</td>
<td>Apr 13 (73)</td>
<td>NA (2)</td>
<td>–</td>
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<tr>
<td>10‡</td>
<td>F</td>
<td>44</td>
<td>Visit relatives</td>
<td>Mauritius</td>
<td>Apr 17 (33)</td>
<td>Apr 19 (2)</td>
<td>Apr 7 (12)</td>
<td>No</td>
</tr>
<tr>
<td>11‡</td>
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<td>May 3 (3)</td>
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<td>Tourism</td>
<td>Réunion</td>
<td>Apr 21 (30)</td>
<td>May 4 (13)</td>
<td>Apr 5 (6)</td>
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<td>13‡</td>
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<td>Visit relatives</td>
<td>Cameroon</td>
<td>May 3 (24)</td>
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<td>Jun 1 (2)</td>
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<td>Jul 10 (16)</td>
<td>Apr 26 (12)</td>
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</table>

*GISPI (Gruppo di Interesse e Studio delle Patologie di Importazione) centers: Torino.
†GISPI center: Udine.
‡GISPI center: Negar. NA, not available.
§GISPI center: Brescia.
¶GISPI center: Triggiano.
Infection with chikungunya virus in Italy: an outbreak in a temperate region

Lancet 2007; 370: 1840–46

G Rezza*, L Nicoletti*, R Angelini, R Romi, A C Finarelli, M Panning, P Cordioli, C Fortuna, S Boros, F Magurano, G Silvi, P Angelini, M Dottori, M G Ciufolini, G C Majori, A Cassone, for the CHIKV study group†
WHO’S NEXT?
Infection rates towards chikungunya virus of mosquito populations collected in southern France in October 2006

<table>
<thead>
<tr>
<th>Species</th>
<th>Site of collection</th>
<th>% Infection (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aedes albopictus</td>
<td>Alpes maritimes</td>
<td>77.1 (35)</td>
</tr>
</tbody>
</table>

Vazeille et al.  
Acta Tropica 2007
A French Air France Hostess returning from a 2-day stay in Singapore (2 Mar 2009 evening to 4 Mar 2009 evening) 
PCR +
Rapid communications

CHIKUNGUNYA INFECTION IN A FRENCH TRAVELLER RETURNING FROM THE MALDIVES, OCTOBER, 2009

M Receveur\(^1\), K Ezzedine (khaled.ezzedine@chu-bordeaux.fr)\(^1\), T Pistone\(^1\), D Malvy\(^1\)

1. Travel Clinics and Unit for Tropical Medicine and Imported Diseases, Department of Internal Medicine and Tropical Diseases, Hôpital St-André, University Hospital Centre, Bordeaux, France


Date of submission: 13 February 2010

In the last years, cases of chikungunya fever have been reported in international travellers returning from the Indian Ocean region. The cases have been linked to the re-emergence of chikungunya fever on Indian Ocean islands in 2006. We describe the first case of chikungunya fever in a French traveller returning from Malé, an island of the Maldives islands, confirming the permanence of virus circulation by the end of 2009.
Dear EuroTravNet and ECDC Friends,

The story of Chikungunya is not finished

US CDC is reporting last week a huge outbreak in Sumatra.


In the GeoS reporting system, 3 cases of CHIK have been recently (since mid January) reported (OSL, PRS, GEN) in turist travellers, returned from India

Let us know if you have any relevant comments/information

Best regards

Phil

EuroTravNet
The European Centre for Disease Prevention and Control Collaborative Network for Travel and Tropical Medicine
The European Travel and Tropical Medicine Network of the International Society of Travel Medicine
Susceptibility of Florida Mosquitoes to Infection with Chikungunya Virus

Michael H. Reiskind, Kendra Pesko, Catherine J. Westbrook, and Christopher N. Mores*

Vector Competence of Australian Mosquitoes for Chikungunya Virus

Andrew F. van den Hurk,1,2 Sonja Hall-Mendelin,2 Alyssa T. Pyke,1 Greg A. Smith,1 and John S. Mackenzie3
Populations of microbes for which epidemiologic niches have been shifted by our globally mobile populations.

For example, travel and migration affect the spread of:
- antimicrobial drug resistance,
- vaccine-preventable diseases,
- multidrug-resistant tuberculosis

Emerg Infect Dis 2009 Nov.
The Holy Grail of Determining Risk

- Travelers’ diarrhea (ETEC > 15% of total) - 20 - 60%
- Malaria (no chemoprophylaxis West Africa)
- Influenza A or B
- Dengue infection (symptomatic) - 1%
- Animal bite with rabies risk
- PPD conversion
- Malaria (with + without chemoprophylaxis Tropical Africa) - 0.1%
- Hepatitis A
- Typhoid (South Asia, N/W/Central-Africa)
- Tick-borne encephalitis (rural Austria) - 0.01%
- Hepatitis B
- Typhoid (other areas)
- HIV-infection
- Fatal accident - 0.001%
- Cholera
- Legionella infection
- Japanese Encephalitis - 0.0001%
- Meningococcal disease
- Poliomyelitis

Increasing Importance of Imported Disease Surveillance

National Public Health Institutions

WHO

US CDC, ECDC

Global and Regional provider-based surveillance networks
The Global Surveillance Network of the ISTM and CDC

A worldwide communications and data collection network of travel/tropical medicine clinics

Provider-based Surveillance of international travelers and migrants.
Does not cover endemic diseases in local populations
48 travel/tropical medicine clinics globally (since 1996) including 14 in Europe
& 185 Network Members on all 6 continents (since 2002)

www.geosentinel.org
3 FUNCTIONS OF GEOSENTINEL

1. Surveillance – Response
   – Alarming sentinel events

2. Surveillance of ongoing trends

3. Analysis of morbidity and estimating risk
   – Diagnosing the ill-returnee (clinician perspective)
   – Advising the traveler (traveler perspective)
Leptospirosis – EcoChallenge, 2000

- September 11, 2000; London site Queries by e-mail concerning ill returnees from Eco-Challenge, Sabah 2000

- Query-Response to GeoS sites: Cases from NYC and Toronto. **Elapsed time = 8 hours.**

- Participants worldwide still within incubation period. Wide broadcast of GeoSentinel Alert to ISTM, ProMed, IDSA, TropMed. **Elapsed time = 14 hours.**

- GeoSentinel sites interface directly with public health authorities in USA, UK, Australia and Canada to contact all at risk individuals. **Elapsed time = 48 hours.**
Schistosomiasis – Tanzania, 2007

  - 23/25 Israeli travelers seropositive, 17/23 symptomatic. No other exposures (except 2 Israeli guides). Predominant *S. mansoni* by WB.
- Aug 31 – Frank von Sonnenburg (MUC) confirms egg positive *S. mansoni* in German journalist who swam in same pool Jan 2007.
- Sept 4 – ProMED-mail posting.
- Oct 26 – US patient ill with confirmed schisto contacts GeoSentinel after Googling “Eyasi schisto” and reading ProMed posting. 4/7 in her party who were tested are seropositive. No previous exposures, all swam once for <1 hour.
Swine Flu H1N1 on GeoSentinel’s HealthMap

Date range: 20 Apr - 14 Aug

Swine Flu H1N1 (94)
GeoSentinel Dataset, Mar 2010

Number of Patients in GeoSentinel \( (n = 119,607) \)

Place of Likely Exposure in Patients Seen After Travel
The Proportionate Morbidity Approach: no. of patients with given diagnosis (or group of diagnoses) / all ill travelers to a destination

Respiratory Tract Infections in Travelers: A Review of the GeoSentinel Surveillance Network

Malaria in Travelers: A Review of the GeoSentinel Surveillance Network
Europeans = the majority of international travellers
n=509 million, 55%

Europe = the world’s largest destination region
n= 490 million, 53%

Leading countries of origin:
• Germany
• the UK
• France
• Italy

National Institutions
ECDC
WP 3: Support to ECDC’s Epidemic Intelligence and Response activities

For the entire duration of the tender, EuroTravNet members will actively participate in the epidemic intelligence activities (support outbreak and cluster detection, verification and investigation) and give advice and guidance for risk assessment and risk communication.

For this purpose EuroTravNet will maintain a 24/7 on call duty system (generic dial-in number and email address) through which the ECDC can access all year round the expertise within the network. The 24/7 System will be in place no later than three months after the signature of the contract that is at the end of the first quarter of 2009.

surveillance@eurotravnet.eu

+33 6 85 xx xx xx
The epidemic intelligence team has picked-up in the last month 2 imported cases of Trypanosomiasis (Promed report below). Would it be possible for you to provide us with a general overview of imported cases of Trypanosomiasis in Europe (excluding Chagas) in the recent years. For instance we would be interested in knowing the number of cases reported, the origin etc.

Thank you in advance for your collaboration.

Programme Officer - Emerging and Vector-borne Diseases Preparedness and Response Unit
ECDC

August 13th, 2009

Rapid communications

IMPORTED HUMAN AFRICAN TRYPANOSOMIASIS IN EUROPE, 2005-2009

P Gautret (surveillance@eurotravnet.eu), J Clerinx, E Caumes, F Simon, M Jensenius, L Loutan, P Schlagenhauf, F Castelli, D Freedman, A Miller, U Bronner, P Parola, for EuroTravNet

August 21st, 2009 submitted. Published in EuroSurveillance September 10
10 ill returned travellers

- 4 Gastro-intestinal diseases
- 2 Febrile systemic illnesses
- 2 Dermatologic
- 1 Respiratory diseases

17228 patients
1997-2007
### Reason for travelling

<table>
<thead>
<tr>
<th></th>
<th>Acute Diarrhea</th>
<th>P. falciparum malaria</th>
<th>Dermatologic</th>
<th>GU STD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tourist</strong></td>
<td>22.7%</td>
<td>5.3%</td>
<td>15.9%</td>
<td>3.0%</td>
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<tr>
<td><strong>Immigrant</strong></td>
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<td>24.8</td>
<td>11.1</td>
<td>4.3</td>
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<tr>
<td><strong>VFR</strong></td>
<td>20.3</td>
<td>5.0</td>
<td>13.3</td>
<td>3.5</td>
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<tr>
<td><strong>Missionary expatriate</strong></td>
<td>20.3</td>
<td>5.0</td>
<td>13.3</td>
<td>3.5</td>
</tr>
</tbody>
</table>

Proportionate Morbidity: no. of patients with given diagnosis (or group of diagnoses) / all ill travelers to a destination
Risk groups: targets for prevention

- **Acute diarrhea**: all categories of European travellers to South Central Asia, North Africa and Middle East, but particularly classic tourist-travellers.

- *P. falciparum* malaria: immigrant-travellers from Italy and France who visit friends and relatives in sub-Saharan Africa and the Indian Ocean Islands.

- **Dengue**: travellers to South East Asia

- **Thyphoid fever**: travellers to South Central Asia

- **Rickettsiosis**: travellers to sub-Saharan Africa

- **Dermatological conditions**: tourist travellers to the Caribbean and Central and South America (parasitic diseases) and to North Africa, Middle East and South East Asia (Potentially rabid animal bites)

- **STD**: missionary expatriate and immigrant VFR travellers to Eastern Europe, South East Asia and Caribbean.
Eu vs Non Eu
Travel associated infectious diseases morbidity in Europe, 2008: 6957 ill returned travellers
3 deaths recorded

- *E. coli* pyelonephritis and sepsis following a 2-month sojourn in Spain
- Dengue Shock Syndrome following a 3 week pre-arranged tourist trip to Phuket
- *P. falciparum* malaria related death in an aid worker who had visited Liberia for three weeks.

**Gastro-intestinal**: 33% of illnesses followed by **febrile systemic illnesses**: 20%

**dermatological conditions**: 12%

and **respiratory illnesses**: 8%
Febrile systemic illnesses (20%) with identified pathogen:

Malaria (5.4%) accounted for most cases followed by dengue (1.9%)

others including chikungunya, rickettsial diseases, leptospirosis, brucellosis, EBV infections, tick-borne encephalitis (TBE) and viral hepatitis.
Dermatological conditions (12% of total): dominated by bacterial infections, arthropod bites, cutaneous larva migrans animal bites requiring rabies post-exposure prophylaxis and also leishmaniasis, myasis, tungiasis and one case of leprosy.

Respiratory illness (8% of total):
• 112 tuberculosis including 6 MDR tuberculosis,
• 104 cases of influenza like illness
• 5 cases of Legionnaires disease.

Sexually transmitted infections (STI): 0.6% including HIV infection and syphilis.

165 cases of potentially vaccine preventable diseases
Purpose of travel and destination specific risk factors was identified for several diagnoses such as

- Chagas disease in immigrant travellers from South America
- *P. falciparum* malaria in immigrants from sub-Saharan Africa (SSA).

Travel within Europe is also associated with health risks with distinctive profiles for Eastern and Western Europe.
<table>
<thead>
<tr>
<th>Patient ID</th>
<th>Age</th>
<th>Gender</th>
<th>Birth Country</th>
<th>Country of Residence</th>
<th>Clinic Visit Date</th>
<th>Record Created Date</th>
<th>Travel Reason</th>
<th>Risk Level Qualifier</th>
<th>Final Exposure</th>
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<td>F</td>
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<td>France</td>
<td>9-Mar-2010</td>
<td>18-Mar-2010</td>
<td>Visiting Friends and Relatives</td>
<td>Risk Travel</td>
<td>Asia</td>
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<td>PSS-1101-A</td>
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<td>Risk Travel</td>
<td>Asia</td>
</tr>
</tbody>
</table>
5 cases of 
Acquired in Comoros (4), and Zanzibar in travellers returning to Marseille and Paris (France) and Stockholm (Sweden).

All cases but one (haemorrhagic) were non-complicated dengue. Two patients were viremic and infected by DENV-3.

Given the presence of *Aedes albopictus* in South Europe, early detection of viremic travellers is critical. Returning travelers serve as sentinels for local outbreaks of dengue fever in endemic areas.
Surveillance in European travellers encompassing a wide range of sites in Europe and addressing all travel-related diseases is a critical issue in order to detect alarming events and emerging infections and if required, to organise a rapid response, as well as to provide reliable data to promote evidence-based travel medicine in Europe.

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